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12/04/2001 - 10:58:18

(12) Patent Application:

(11) CA 2230443

(54) PROCESS FOR THE PRODUCTION OF ULTRAFINE PARTICLES

(54) PROCÉDÉ DE PRODUCTION DE PARTICULES ULTRAFINES

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(45) Issued on:

(22) Filed on: Aug. 28, 1996

(43) Laid open on: Mar. 6, 1997

(51) International Class (IPC): C22C 1/00 C22B 5/02 B22F 9/16
 C04B 35/622

Patent Cooperation Treaty (PCT): Yes

(85) <u>National entry on</u> :	Feb. 25, 1998
(86) <u>PCT Filing number</u> :	PCT/AU96/00539
(87) <u>International publication number</u> :	WO97/07917

(30) Application priority data:

Application No.	Country	Date
PN 5047	Australia	Aug. 28, 1995
PN 7725	Australia	Jan. 22, 1996

Availability of licence:

N/A

Language of filing:

English

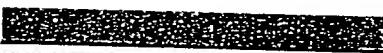
ABSTRACT:

A new, cost effective process for the production of ultrafine particles which is based on mechanically activated chemical reaction of a metal compound with a suitable reagent. The process involves subjecting a mixture of a metal compound and a suitable reagent to mechanical activation to increase the chemical reactivity of the reactants and/or reaction kinetics such that a chemical reaction can occur which produces a solid nano-phase substance. Concomitantly, a by-product phase is also formed. This by-product phase is removed so that the solid nano-phase substance is left behind in the form of ultrafine particles. During mechanical activation a composite structure is formed which consists of an intimate mixture of nano-sized grains of the nanophase substance and the reaction by-product phase. The step of removing the byproduct phase, following mechanical activation, may involve subjecting the composite structure to a suitable solvent which dissolves the by-product phase, while not reacting with the solid nano-phase substance. The process according to the invention may be used to form ultrafine metal powders as well as ultrafine ceramic powders. Advantages of the process include a significant degree of control over the size and size distribution of the ultrafine particles, and over the nature of interfaces created between the solid nanophase substance and the reaction by-product phase.

CLAIMS: [Show all claims](#)

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